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ABSTRACT

This paper called attention to needed research in the application of principles of learning to American Indian education. The matter of suitable rewards (contingency management) was examined, and 5 areas of needed research were identified. Concept formation was felt to be the heart of language learning, and 3 kinds of research problems in terms of concept formation were examined. The existence of communication problems between Indian pupils and their parents was faced; in keeping with this, it was noted that certain school practices often exacerbate this problem and it was urged that comprehensive analysis be made of the goals for education held by selected members of the educational community (parents, tribal officers, educators, pupils)--thus leading to construction of curriculum designs and materials of high cultural relevance. Finally, in the area of teacher reeducation, it was recommended that studies be undertaken which combine teacher involvement and contingency management. (LS)

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NEEDED RESEARCH IN PRINCIPLES OF LEARNING

(as applied to Indian education)

A Position Paper
Submitted to
Southwestern Cooperative Educational Laboratory

By
James G. Cooper and Robert Norris
May 28, 1970

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NEEDED RESEARCH IN PRINCIPLES OF LEARNING

(AS APPLIED TO INDIAN EDUCATION)

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Scope and Nature of Problem

For many years, educators have realized that Indian pupils fail to achieve at levels commensurate to their Anglo peers. In recent years, this has been documented again by BIA educators, as well as by state superintendents of instruction. A case in point is provided by Supt. L. Delayo. He reported that Indian pupils in grades 5, 8 and 11 were from 3 to 5 years academically retarded in a sample of New Mexico schools (May, 1969).

The problem appears in other guises: high dropout rates among Indian pupils at all levels of the educational spectrum; high unemployment rates; high endemic illnesses. These kinds of data show that present programs are not meeting the needs of Indian pupils.

Why not? The causes may lie in several areas, e.g.,

1. Teachers may be poorly equipped to deal with own children, much less with the (unique) problems posed by Indian learners.

2. The curriculum may lack relevance for these children.

3. The school's climate for learning may be alien to the child.

4. Problems of health (rest, nutrition, etc.) may interfere.

5. Principles of learning may be applied inappropriately, or certain principles may possess only limited validity for the Indian pupil.

Although each of the points raised above can (and very probably does) contribute to educational retardation, this paper addresses itself primarily to the matter of point 5, learning principles and their applications.

Rewards, contingency management, and motivation

The past decade has seen the growth and application of Skinnerian-type of reward systems to the management of learning. An initial research question might simply be, "To what extent are rewards employed in learning

for Indian pupils?" Operational definitions for "reward" must be devised, but with the current research base available, this should not tax researchers.

A second, and more crucial question is, "Which rewards are most efficient for Indian learners?" This question must be broken into components, such as age-level of the learner, subject matter or behavior under consideration, duration of reward, amount and frequency of reward, and conditions of giving reward (levels of achievement required). Some data suggest that males react to rewards in a manner different from females; this affects Indian learners should be determined.

Central to the application of rewards to the learning process is the specification of behavioral goals. That is, which behaviors are to be rewarded? A survey research would reveal the extent to which the schools and Indian communities behavioralized their instructional goals. In the event that this thrust has not yet made its mark in Indian education, certain implications for teacher education would be evident.

Motivation, once a favorite research topic, has tended to take a back seat in favor of reward systems. It is now recognized that motivation and rewards are much the same thing. This, then, raises another point. Are learning environments, i.e., the classrooms, the school rules, the school activities, conducive to learning? That is, do our learning environments themselves possess adequate amounts of positive reinforcers for Indian pupils? In all too many cases, cursory examination would suggest not. That is, pupils are brought from their isolated homes, pueblos, hogans and stuffed into a foreign frightening building called, "school". The school is loaded with elements previously unknown to the Indian child. It is not likely that this sort of alien environment provides much in the way of positive reinforcement. Research of a systems type needs to probe this situation to determine the degree of alienation, and to find ways to ameliorate the situation. Subsequent research should determine the effectiveness of any changes.

Apropos of this problem, a researcher noted that Santo Domingo Pueblo pupils reacted anxiously to situations involving animals, being alone, or night. The same researcher also noted that primary grade classrooms were filled with the fear-provoking stimuli: the classrooms were veritable zoos with all of the animal pictures and stories! Environmental, or ecological research of the type advocated by Paul Gump is needed to explore the effects of these sorts of variables upon the course of learning.

In summary of needed research on rewards, and rewards' systems, we list the following:

1. What rewards (reinforcers) are most effective?
   The research paradigm should include the variables of sequence, amount, age, sex, grade, tribe, and types of behaviors (psychomotor, social, cognate, or affect).

2. The kind and degree to which rewards are being currently employed should be examined. This study should produce recommendations for

specific kinds of pre- or in-service educational experience needed for Indian teachers.

3. Based upon the results of 2 (above) an evaluative research should test the effectiveness of efforts made to modify teacher behaviors. The criteria should include both teacher behaviors and pupil behaviors.

4. Ecological analyses should be conducted to determine the effects upon pupil behavior of school learning environments. Such research should recommend changes.

5. Based upon 4 (above) studies should determine the effects of changes in the ecosystem subsequent pupil behavior.

Concept Formation

The business of education is largely concerned with concept formation. Concepts about nature, mathematics, language, in short, of our world. The Indian child typically is required to learn almost immediately, two difficult sets of concepts, one set being dependent upon the other. We are referring to the stress given to English as the child's first steps into school. Concurrently, the child is required to master another set of concepts, those related to the world about him.

Language, we have begun to know, is a complex, difficult tool for even the native child. Yet, success in language learning is prerequisite for success in all of subsequent concept learning. As mentioned earlier in this paper, the evidence is dismally abundant that the Indian child has had but little success in meeting these twin objectives. There are two separate research problems involved. First, what is the most expeditious approach:

a. teach in the child's native language, for a period of time (how long?) with a gradual transition to English

b. start English with some of the native language, or

c. all English at the outset?

Second, while we teach language concepts (in either English or the native language), what should be the nature and type of new concepts to which the child is introduced?

Considerable work is currently (1970) in progress on teaching English as a second language. The theoretical bases range from simple to complex (as in B. Spolsky's work). A part of the problem as it relates to Indian education is complicated by the fact the Indian education community needs to reach a decision on the role of the Indian language(s) in the school curriculum. Each of the several alternatives (teach wholly in the native language for X number of years, teach partially in the native language for

X number of years, limit teaching activity to English solely) possess different kinds of problems. Basically, we need to determine in a quantitative sense the number of new concepts that the child will be required to master at differing levels of education. It should be evident that as the conceptual load in English increases, then the corresponding conceptual load required in other areas of study should decrease. To date, research has not provided guidelines on this issue. The work of linguists and reading experts needs to be pooled for accurate estimates of the work loads imposed by the various types of curricular requirements. Specific studies should be aimed at establishing optimal levels of required concept learning.

Akin to this analysis is that of discovering the kinds of concepts the Indian child fetches with him to school. That is, does the entering first grader, or sixth grader, or tenth grader, for example, possess the concept of "square"? Of "electricity"? Of "science"? Studies aimed at determining levels of concept attainment are needed in order for curriculum planners to do efficient work in scope and sequence of studies (to the extent that these can be rational decisions).

In summary, research is needed:

1. to determine the extent and degree to which certain key concepts are possessed by the Indian pupil. Independent variables should include age, sex, tribe, learning ability, and category of concept.

2. to determine the efficiency of teaching in the child's native language vs. teaching in English.

3. to determine the kinds and levels of concepts required by different curricular formulations. The degree to which these requirements are attainable should be established.

Communication Problems

Normally, this topic would be included in a discussion of concept formation. But because of its unique aspects in relation to Indian education, it is examined here as a separate problem. Evidence has accumulated that our current educational methods achieve goals that were unintended. The biggest (main) problem lies in communication. The Indian pupil comes home. He is not able to converse with his parents upon the subjects learned at school; this is a closed area to most parents. Conversely, the child is not able to communicate fluently about local topics, because he has not kept up with his own native language development. And third, an area that was once shared by old and young alike is barred! Parents and elders no longer are able to raise the young in the lore and heritage of the people. The facts of school attendance, summer programs, and the like, serve to alienate the child from his culture, and thus from an arena that was once rich with communications potential. IF it is important for the child to retain his cultural identity, and if it is important to strengthen communications between

the child and his own culture, then the school needs to re-examine its position on what is relevant for the school curriculum. This quickly becomes the basic issue of "Who is to determine the curriculum?" Although this is not a research question, certain research tools can be applied to its resolution.

First must be answered the key question of "Who?". If it is agreed that the child's people are to have a voice in educational decision-making, then studies need to be launched to the end that the views of the others (the tribe, the pupils, the council, educators) are identified. Researchers and ideally the community, need to be involved in the development of interview schedules, defining of populations, training of interviewers, designing methods for data analysis, processing the data, and drawing conclusions. This process would result in providing decision-makers with the pulse of the consumers on their desires for the education of their children. The model is that of survey research with the interview as the principal data gathering method. The focus can range from the goals of Indian education to specific issues, e.g., addition with whole numbers, to mathematics of the market-place.

Summary: Survey research models need to be applied to the questions of:

1) What goals are desired by the educational community?

2) How can communication be established between child and home? And once a program aimed at strengthening communication is

3) established, to what extent does it "work"?

4) What and how do Indians teach their children?

Teacher Learning and Relearning

From the foregoing discussion, it is obvious that certain changes will be required inorder to bring the results of education for Indians up to the expectations of its supporters. These changes will, in high probability, require certain changes in teacher, administrator, student, and parent behavior. Consequently, retraining programs will be needed. The retraining problem will be more or less complex according to the extent of changes desired in the school organization and system. Some of the issues raised earlier might indeed require extensive program revision.

Teachers and administrators have demonstrated strong and pervasive resistance to change. It is likely that new strategies are needed to provoke the deep changes implied in the earlier discussion. At least two learning principles are involved: teacher and administrator participation, and contingency management. Let us suppose, for example, that we decide to teach much of the early grades in the native language, and that the curriculum will include many materials of high cultural relevance (folklore, myths, tales of the elders). Since it was agreed earlier that the educational

community would be included, settings would be arranged for parents, pupils, officials would meet and work together; sufficient interpreters would be available (college and high school pupils?). This group would make major policy recommendations. Smaller groups would be appointed to implement the recommendations. These smaller groups would include larger proportions of the school's professionals. To these latter groups would be offered specific rewards for accomplishing specific, defined tasks, e.g. the preparation and publication of curriculum materials based upon cultural values. Further, additional rewards would be offered for evaluating the curriculum materials. The rewards actually employed could range from certain forms of social approval, to more material rewards: release from teaching for a Friday awarding a special trip or conference, to monetary rewards, as are currently applied in business and industry.

We would expect for foregoing program itself to be evaluated. We would want to know the number of materials produced, the degree of involvement of various classes of participants, and the like. If these efforts were successful, at least one outcome would be that of culturally relevant materials actually used by the teachers.

In general, the reeducation model of teacher participation plus contingency management needs to be examined as a research hypothesis. Do these methods yield the desired payoff? If they do, then they should be continued. If not, then modifications should be made and retested.

Summary

This paper has called attention to needed research in the application of principles of learning to Indian education. The matter of suitable rewards (contingency management) was examined in some detail. Five kinds of research areas were identified.

Concept formation was felt to be the heart of the learning process. This takes on special significance in language learning. Three kinds of research problems were examined.

The existance of communication problems between Indian pupils and their parents was faced. It was noted that certain school practices often exacerbate this problem. It was urged that comprehensive analysis be made of the goals for education held by selected members of the educational community (parents, tribal officers, educators, pupils). The results should lead to construction of curriculum designs and curriculum material of high cultural relevance. The problem of learning a new culture is implied, but not directly stated.

Finally, thought was given to the problem of teacher reeducation. It was recommended that studies be undertaken which combine teacher involvement and contingency management.